

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (original) A moving picture encoding method characterized by comprising at least the steps of:

obtaining a temporally hierarchized signal by temporally hierarchically dividing a moving picture signal;

obtaining a temporally hierarchized spatial high-frequency signal by performing a high frequency generation process on the temporally hierarchized signal in spatial hierarchical division;

obtaining a reduced image signal by performing a low frequency generation process on the moving picture signal in spatial hierarchical division; and

obtaining a reduced temporally hierarchized signal by temporally hierarchizing the reduced image signal.

2. (original) A moving picture encoding method according to claim 1, characterized in that the temporally hierarchized spatial high-frequency signal and reduced temporally hierarchized signal are encoded.

3. (original): A moving picture encoding method characterized by comprising at least the steps of:

obtaining a prediction error signal by performing interframe prediction on a moving picture signal;

obtaining a prediction error spatial high-frequency signal by performing a high frequency generation process on the prediction error signal in spatial hierarchical division;

obtaining a reduced image signal by performing a low-frequency signal generation process on the moving picture signal in spatial hierarchical division; and

obtaining a reduced interframe prediction error signal as a prediction error signal by performing interframe prediction on the reduced image signal.

4. (original) A moving picture encoding method according to claim 3, characterized in that the prediction error spatial high-frequency signal and reduced interframe prediction error signal are encoded.

5. (original): A moving picture encoding method of performing a three-dimensional subband dividing process which performs motion compensation prediction on a moving picture signal and also subband divides the moving picture signal in a spatial direction, characterized in that the three-dimensional subband dividing process comprises at least:

the motion detection step of obtaining motion information by detecting an interframe motion of the moving picture signal;

the motion compensation prediction step of obtaining a prediction error signal by performing motion compensation prediction on the moving picture signal in accordance with the motion information;

the prediction error signal spatial division step of generating a spatial low-frequency prediction error subband signal and spatial high-frequency prediction error subband signal by spatially subband dividing the prediction error signal; and

the band signal spatial division step of generating a spatial low-frequency intra-subband signal and spatial high-frequency intra-subband signal by spatially subband dividing the moving picture signal.

6. (original) A moving picture encoding method according to claim 5, characterized in that the motion compensation prediction step, prediction error signal spatial division step, and band signal spatial division step are performed on the moving picture signal, and the motion compensation prediction step, prediction error signal spatial division step, and band signal spatial division step are recurrently repeated by replacing the spatial low-frequency intra-subband signal obtained after the band signal spatial division step with the moving picture signal.

7-8. (canceled).

9.: (original): A moving picture encoding method of performing a three-dimensional subband dividing process which subband divides a moving picture signal in both a temporal direction and spatial direction, characterized in that the three-dimensional subband dividing process comprises at least:

the motion detection step of obtaining motion information by detecting an interframe motion of the moving picture signal;

the temporal subband division step of obtaining a temporal low-frequency subband signal and temporal high-frequency subband signal by motion compensating the moving picture signal in accordance with the motion information, and temporally subband dividing the motion compensated moving picture signal;

the temporal high-frequency subband spatial division step of generating a temporal high-frequency/spatial low-frequency subband signal and temporal high-frequency/spatial high-frequency subband signal by spatially subband dividing the temporal high-frequency subband signal;

the temporal low-frequency subband spatial division step of generating a temporal low-frequency/spatial low-frequency subband signal and temporal low-frequency/spatial high-frequency subband signal by spatially subband dividing the temporal low-frequency subband signal; and

the band signal spatial division step of generating a spatial low-frequency intra-subband signal and spatial high-frequency intra-subband signal by spatially subband dividing the moving picture signal.

10. (original): A moving picture encoding method according to claim 9, characterized in that the temporal subband division step, temporal high-frequency subband spatial division step, temporal low-frequency subband spatial division step, and band signal spatial division step are performed on the moving picture signal, and the temporal subband division step, temporal high-frequency subband spatial division step, temporal low-frequency subband spatial division step, and band signal spatial division step are recurrently repeated by replacing the spatial low-frequency intra-subband signal obtained after the band signal spatial division step with the moving picture signal.

11-12. (canceled).

13-27. (withdrawn).

28. (original) A moving picture encoding method characterized by comprising the steps of:

obtaining a time filtering signal by filtering a moving picture signal in a temporal direction;

obtaining a time filtering lower hierarchy signal and time filtering upper hierarchy signal by spatially hierarchically dividing the time filtering signal;

obtaining an upper hierarchy moving picture signal by spatially hierarchically dividing the moving picture signal;

obtaining an upper hierarchy time filtering signal by filtering the upper hierarchy moving picture signal in the temporal direction; and

encoding the time filtering lower hierarchy signal and upper hierarchy time filtering signal.

29. (original): A moving picture encoding method according to claim 28, characterized by further comprising the step of replacing the time filtering upper hierarchy signal with the upper hierarchy time filtering signal.

30-31. (withdrawn).

32. (currently amended): A non-transitory computer readable medium having stored therein a moving picture encoding program characterized by executing at least the steps of:

obtaining a temporally hierarchized signal by temporally hierarchically dividing a moving picture signal;

obtaining a temporally hierarchized spatial high-frequency signal by performing a high frequency generation process on the temporally hierarchized signal in spatial hierarchical division;

obtaining a reduced image signal by performing a low frequency generation process on the moving picture signal in spatial hierarchical division; and

obtaining a reduced temporally hierarchized signal by temporally hierarchizing the reduced image signal.

33. (original): A moving picture encoding program according to claim 32, characterized in that the temporally hierarchized spatial high-frequency signal and reduced temporally hierarchized signal are encoded.

34. (currently amended) A non-transitory computer readable medium having stored therein a moving picture encoding program characterized by executing at least the steps of:

obtaining a prediction error signal by performing interframe prediction on a moving picture signal;

obtaining a prediction error spatial high-frequency signal by performing a high frequency generation process on the prediction error signal in spatial hierarchical division;

obtaining a reduced image signal by performing a low-frequency signal generation process on the moving picture signal in spatial hierarchical division; and

obtaining a reduced interframe prediction error signal as a prediction error signal by performing interframe prediction on the reduced image signal.

35. (original): A moving picture encoding program according to claim 34, characterized in that the prediction error spatial high-frequency signal and reduced interframe prediction error signal are encoded.

36. (currently amended) A non-transitory computer readable medium having stored therein a moving picture encoding program of performing a three-dimensional subband dividing process which performs motion compensation prediction on a moving picture signal and also subband divides the moving picture signal in a spatial direction, characterized in that the three-dimensional subband dividing process executes at least:

the motion detection step of obtaining motion information by detecting an interframe motion of the moving picture signal;

the motion compensation prediction step of obtaining a prediction error signal by performing motion compensation prediction on the moving picture signal in accordance with the motion information;

the prediction error signal spatial division step of generating a spatial low-frequency prediction error subband signal and spatial high-frequency prediction error subband signal by spatially subband dividing the prediction error signal; and

the band signal spatial division step of generating a spatial low-frequency intra-subband signal and spatial high-frequency intra-subband signal by spatially subband dividing the moving picture signal.

37. (original): A moving picture encoding program according to claim 36, characterized in that the motion compensation prediction step, prediction error signal spatial division step, and band signal spatial division step are performed on the moving picture signal, and the motion compensation prediction step, prediction error signal spatial division step, and band signal spatial division step are recurrently repeated by replacing the spatial low-frequency intra-subband signal obtained after the band signal spatial division step with the moving picture signal.

38-39. (canceled).

40. (currently amended) A non-transitory computer readable medium having stored therein a moving picture encoding program of performing a three-dimensional subband dividing process which subband divides a moving picture signal in both a temporal direction and spatial direction, characterized in that the three-dimensional subband dividing process executes at least:

the motion detection step of obtaining motion information by detecting an interframe motion of the moving picture signal;

the temporal subband division step of obtaining a temporal low-frequency subband signal and temporal high-frequency subband signal by motion compensating the moving picture signal in accordance with the motion information, and temporally subband dividing the motion compensated moving picture signal;

the temporal high-frequency subband spatial division step of generating a temporal high-frequency/spatial low-frequency subband signal and temporal high-frequency/spatial high-frequency subband signal by spatially subband dividing the temporal high-frequency subband signal;

the temporal low-frequency subband spatial division step of generating a temporal low-frequency/spatial low-frequency subband signal and temporal low-frequency/spatial high-frequency subband signal by spatially subband dividing the temporal low-frequency subband signal; and

the band signal spatial division step of generating a spatial low-frequency intra-subband signal and spatial high-frequency intra-subband signal by spatially subband dividing the moving picture signal.

41. (original): A moving picture encoding program according to claim 40, characterized in that the temporal subband division step, temporal high-frequency subband spatial division step, temporal low-frequency subband spatial division step, and band signal spatial division step are performed on the moving picture signal, and the temporal subband division step, temporal high-frequency subband spatial division step, temporal low-frequency subband spatial division step, and band signal spatial division step are recurrently repeated by replacing the spatial low-frequency intra-subband signal obtained after the band signal spatial division step with the moving picture signal.

42-43. (canceled).

44-58. (withdrawn).

59. (currently amended) A non-transitory computer readable medium having stored therein a moving picture encoding program characterized by comprising the steps of:

obtaining a time filtering signal by filtering a moving picture signal in a temporal direction;

obtaining a time filtering lower hierarchy signal and time filtering upper hierarchy signal by spatially hierarchically dividing the time filtering signal;

obtaining an upper hierarchy moving picture signal by spatially hierarchically dividing the moving picture signal;

obtaining an upper hierarchy time filtering signal by filtering the upper hierarchy moving picture signal in the temporal direction; and

encoding the time filtering lower hierarchy signal and upper hierarchy time filtering signal.

60. (original): A moving picture encoding program according to claim 59, characterized by further comprising the step of replacing the time filtering upper hierarchy signal with the upper hierarchy time filtering signal.

61-62. (withdrawn).

63. (original): A moving picture encoding device characterized by comprising at least:

means for obtaining a temporally hierarchized signal by temporally hierarchically dividing a moving picture signal;

means for obtaining a temporally hierarchized spatial high-frequency signal by performing a high frequency generation process on the temporally hierarchized signal in spatial hierarchical division;

means for obtaining a reduced image signal by performing a low frequency generation process on the moving picture signal in spatial hierarchical division; and

means for obtaining a reduced temporally hierarchized signal by temporally hierarchizing the reduced image signal.

64. (original): A moving picture encoding device according to claim 63, characterized in that the temporally hierarchized spatial high-frequency signal and reduced temporally hierarchized signal are encoded.

65. (original): A moving picture encoding device characterized by comprising at least:

means for obtaining a prediction error signal by performing interframe prediction on a moving picture signal;

means for obtaining a prediction error spatial high-frequency signal by performing a high frequency generation process on the prediction error signal in spatial hierarchical division;

means for obtaining a reduced image signal by performing a low-frequency signal generation process on the moving picture signal in spatial hierarchical division; and

means for obtaining a reduced interframe prediction error signal as a prediction error signal by performing interframe prediction on the reduced image signal.

66. (original): A moving picture encoding device according to claim 65, characterized in that the prediction error spatial high-frequency signal and reduced interframe prediction error signal are encoded.

67. (original): A moving picture encoding device for performing a three-dimensional subband dividing process which performs motion compensation prediction on a moving picture signal and also subband divides the moving picture signal in a spatial direction, characterized in that the three-dimensional subband dividing process comprises at least:

motion detecting means for obtaining motion information by detecting an interframe motion of the moving picture signal;

motion compensation predicting means for obtaining a prediction error signal by performing motion compensation prediction on the moving picture signal in accordance with the motion information;

prediction error signal spatial dividing means for generating a spatial low-frequency prediction error subband signal and spatial high-frequency prediction error subband signal by spatially subband dividing the prediction error signal; and

band signal spatial dividing means for generating a spatial low-frequency intra-subband signal and spatial high-frequency intra-subband signal by spatially subband dividing the moving picture signal.

68. (original): A moving picture encoding device according to claim 67, characterized in that said motion compensation predicting means, prediction error signal spatial dividing means, and band signal spatial dividing means are performed on the moving picture signal, and the processes of said motion compensation predicting means, prediction error signal spatial dividing means, and band signal spatial dividing means are recurrently repeated by replacing the spatial low-frequency intra-subband signal obtained after said band signal spatial dividing means with the moving picture signal.

69-70. (canceled).

71. (original): A moving picture encoding device for performing a three-dimensional subband dividing process which subband divides a moving picture signal in both a temporal

direction and spatial direction, characterized in that the three-dimensional subband dividing process comprises at least:

motion detecting means for obtaining motion information by detecting an interframe motion of the moving picture signal;

temporal subband dividing means for obtaining a temporal low-frequency subband signal and temporal high-frequency subband signal by motion compensating the moving picture signal in accordance with the motion information, and temporally subband dividing the motion compensated moving picture signal;

temporal high-frequency subband spatial dividing means for generating a temporal high-frequency/spatial low-frequency subband signal and temporal high-frequency/spatial high-frequency subband signal by spatially subband dividing the temporal high-frequency subband signal;

temporal low-frequency subband spatial dividing means for generating a temporal low-frequency/spatial low-frequency subband signal and temporal low-frequency/spatial high-frequency subband signal by spatially subband dividing the temporal low-frequency subband signal; and

band signal spatial dividing means for generating a spatial low-frequency intra-subband signal and spatial high-frequency intra-subband signal by spatially subband dividing the moving picture signal.

72. (original): A moving picture encoding device according to claim 71, characterized in that said temporal subband dividing means, temporal high-frequency subband spatial dividing means, temporal low-frequency subband spatial dividing means, and band signal spatial dividing means are performed on the moving picture signal, and the processes of said temporal subband dividing means, temporal high-frequency subband spatial dividing means, temporal low-frequency subband spatial dividing means, and band signal spatial dividing means are recurrently repeated by replacing the spatial low-frequency intra-subband signal obtained after said band signal spatial dividing means with the moving picture signal.

73-74. (canceled).

75. (original): A moving picture encoding device characterized by comprising at least:

- means for generating a temporal high-frequency/spatial low-frequency signal by referring to a temporal high-frequency signal, temporal low-frequency signal, and temporal low-frequency/spatial high-frequency signal;
- means for generating a second temporal low-frequency signal by referring to the temporal low-frequency signal and temporal low-frequency/spatial high-frequency signal;
- means for generating a second temporal high-frequency signal by using the temporal high-frequency/spatial low-frequency signal and a temporal high-frequency/spatial high-frequency signal; and

means for combining the second temporal low-frequency signal and second temporal high-frequency signal.

76-89. (withdrawn).

90. (original): A moving picture encoding device characterized by comprising at least:

means for obtaining a time filtering signal by filtering a moving picture signal in a temporal direction;

means for obtaining a time filtering lower hierarchy signal and time filtering upper hierarchy signal by spatially hierarchically dividing the time filtering signal;

means for obtaining an upper hierarchy moving picture signal by spatially hierarchically dividing the moving picture signal;

means for obtaining an upper hierarchy time filtering signal by filtering the upper hierarchy moving picture signal in the temporal direction; and

means for encoding the time filtering lower hierarchy signal and upper hierarchy time filtering signal.

91. (original): A moving picture encoding device according to claim 90, characterized by further comprising means for replacing the time filtering upper hierarchy signal with the upper hierarchy time filtering signal.

AMENDMENT UNDER 37 C.F.R. § 1.111
Appln. No.: 10/563,618

Attorney Docket No.: Q92481

92-93. (withdrawn).